

CLAIMS

1. A condenser comprising an inlet header and an outlet header spaced apart from each other in a left-right direction and extending vertically, a plurality of flat refrigerant tubes arranged one above another in parallel at a spacing between the two headers and jointed at opposite ends thereof to the respective headers and fins provided between respective adjacent pairs of refrigerant tubes, the inlet header having a refrigerant inlet for admitting a refrigerant into interior thereof therethrough, the outlet header having a refrigerant outlet for causing the refrigerant to flow out therethrough, the refrigerant as admitted into the inlet header through the inlet being flowable through all the refrigerant tubes toward the outlet header, the number of refrigerant tubes positioned below the center of the refrigerant inlet with respect to the vertical direction being up to 21.

2. A condenser according to claim 1 wherein the number of refrigerant tubes positioned below the center of the refrigerant inlet with respect to the vertical direction is up to 7.

3. A condenser according to claim 1 which has 22 to 70 refrigerant tubes in total.

4. A condenser according to claim 1 which is 150 to 500 mm in height as the condenser is seen from the front, 200 to 800 mm in left-to-right width, 0.8 to 3 mm in the height of the refrigerant tubes, and 4.5 to 12 mm in the spacing between each adjacent pair of refrigerant tubes.

5. A condenser according to claim 1 wherein the refrigerant

to be used contains 3 to 10 mass % of a compressor lubricant admixed therewith.

6. A condenser comprising two headers spaced apart from each other in a left-right direction and extending vertically, a plurality of flat refrigerant tubes arranged one above another in parallel at a spacing between the two headers and jointed at opposite ends thereof to the respective headers and fins provided between respective adjacent pairs of refrigerant tubes, a plurality of tube groups arranged one above another in parallel and each comprising some of the refrigerant tubes as arranged one above another in parallel in succession, a refrigerant being flowable in the same direction through all the refrigerant tubes constituting each of the tube groups, each adjacent pair of tube groups being different in the direction of flow of the refrigerant therethrough, one of the headers having a refrigerant inlet at a level corresponding to the tube group at an upper end for admitting the refrigerant into interior thereof therethrough, said one header having the refrigerant inlet or the other header being provided with a refrigerant outlet at a level corresponding to the tube group at a lower end for causing the refrigerant to flow out therethrough, the refrigerant as admitted through the inlet being flowable through the refrigerant tubes of all the tube groups so as to be discharged through the outlet, the number of refrigerant tubes included in the upper-end tube group and positioned below the center of the refrigerant inlet with respect to the vertical direction being up to 21.

7. A condenser according to claim 6 wherein the number

of refrigerant tubes included in the upper-end tube group and positioned below the center of the refrigerant inlet with respect to the vertical direction is up to 7.

8. A condenser according to claim 6 wherein the upper-end
5 tube groups has 22 to 70 refrigerant tubes in total.

9. A condenser according to claim 6 which is 200 to 800 mm in left-to-right width, 0.8 to 3 mm in the height of the refrigerant tubes, 4.5 to 12 mm in the spacing between each adjacent pair of refrigerant tubes, and 150 to 500 mm in the
10 height of the upper-end tube group as it is seen from the front.

10. A condenser according to claim 6 wherein the refrigerant to be used contains 3 to 10 mass % of a compressor lubricant admixed therewith.

11. A heat exchanger having a condenser portion comprising
15 a condenser according to claim 1, and a supercooler portion disposed under the condenser portion and comprising a pair of headers spaced apart from each other in a left-right direction and extending vertically, a plurality of flat refrigerant tubes arranged one above another in parallel at
20 a spacing between the two headers and jointed at opposite ends thereof to the respective headers and fins provided between respective adjacent pairs of refrigerant tubes, the outlet header of the condenser portion being provided with one of the headers of the supercooler portion with a partition
25 interposed therebetween, the inlet header of the condenser portion being provided with the other header of the supercooler portion with a partition interposed therebetween, a receiver tank being attached to both the outlet header of the condenser

portion and said one header of the supercooler portion, the refrigerant as discharged from the refrigerant outlet of the condenser portion being flowable into said one header of the supercooler portion through the receiver tank.

5 12. A heat exchanger having a condenser portion comprising a condenser according to claim 6, and a supercooler portion disposed under the condenser portion and comprising a pair of headers spaced apart from each other in a left-right direction and extending vertically, a plurality of flat
10 refrigerant tubes arranged one above another in parallel at a spacing between the two headers and jointed at opposite ends thereof to the respective headers and fins provided between respective adjacent pairs of refrigerant tubes, one of the headers having the refrigerant outlet and included in the
15 condenser portion being provided with one of the headers of the supercooler portion with a partition interposed therebetween, the other header of the condenser portion being provided with the other header of the supercooler portion with a partition interposed therebetween, a receiver tank being
20 attached to both the header having the refrigerant outlet and included in the condenser portion and said one header of the supercooler portion, the refrigerant as discharged from the refrigerant outlet of the condenser portion being flowable into said one header of the supercooler portion through the
25 receiver tank.

13. A heat exchanger according to claim 11 or 12 wherein the refrigerant to be used contains 3 to 10 mass % of a compressor lubricant admixed therewith.

14. A refrigeration cycle having a compressor, a condenser according to claim 1 or 6, a pressure reducer and an evaporator, the refrigeration cycle being adapted for use with a refrigerant containing 3 to 10 mass % of a compressor lubricant admixed
5 therewith.

15. A vehicle comprising a refrigeration cycle according to claim 14 as an air conditioner.

16. A refrigeration cycle having a compressor, a heat exchanger according to claim 11 or 12, a pressure reducer and
10 an evaporator, the refrigeration cycle being adapted for use with a refrigerant containing 3 to 10 mass % of a compressor lubricant admixed therewith.

17. A vehicle comprising a refrigeration cycle according to claim 16 as an air conditioner.